

Listing of claims

86. (Currently amended) A method of determining the presence of anti-Factor VIII allo-antibodies capable of degrading Factor VIII in a mammal, which comprises :

- i) isolating the plasma from a sample of blood taken from said mammal,
- ii) isolating anti-Factor VIII allo-antibodies from said plasma ;
- iii) placing said anti-Factor VIII allo-antibodies in contact with Factor VIII for a period of time sufficient to permit any degradation of said Factor VIII by said anti-Factor VIII allo-antibodies ; and
- iv) determining, after said period of time, whether said Factor VIII has effectively been degraded by said anti-Factor VIII allo-antibodies.

87. (Previously presented) The method of claim 86, wherein in step ii), said anti-Factor VIII allo-antibodies are isolated from said plasma by combining them with said Factor VIII.

88. (Previously presented) The method of claim 87, wherein said Factor VIII is coupled to a matrix.

89. (Previously presented) The method of claim 86, wherein in step ii), said anti-Factor VIII allo-antibodies are isolated by affinity chromatography.

90. (Previously presented) The method of claim 89, wherein in step ii), said affinity chromatography comprises the use of Factor VIII covalently coupled to a Sepharose matrix.

91. (Previously presented) The method of claim 90, wherein said Sepharose matrix is activated with cyanogen bromide.

92. (Previously presented) The method of claim 86, wherein in step iii), said Factor VIII is labelled with a labelling agent.

93. (Previously presented) The method of claim 92, wherein said labelling agent is a radio-labelling agent.

94. (Previously presented) The method of claim 93, wherein said radio-labelling agent is ^{125}I .

95. (Previously presented) The method of claim 86, wherein in step iii), said Factor VIII is placed in contact with the anti-Factor VIII allo-antibodies for a period of time of between about 0.5 and about 30 hours, at a temperature of about 15 to about 40°C.

96. (Previously presented) The method of claim 86, wherein in step iii), said Factor VIII is placed in contact with the anti-Factor VIII allo-antibodies for a period of time of about 10 hours, at a temperature of about 15 to about 40°C.

97. (Previously presented) The method of claim 86, wherein in step iii), said Factor VIII is placed in contact with the anti-Factor VIII allo-antibodies for a period of time of between about 0.5 and about 30 hours, at a temperature of 38°C.

98. (Previously presented) The method of claim 86, wherein in step iii), said Factor VIII is placed in contact with the anti-Factor VIII allo-antibodies for a period of time of about 10 hours, at a temperature of 38°C.

99. (Previously presented) The method of claim 86, wherein step iv) is carried out by a determination comprising a separation technique and a visualisation technique.

100. (Previously presented) The method of claim 99, wherein said separation technique is selected from the group consisting of gel electrophoresis, and gel filtration.

101. (Previously presented) The method of claim 100, wherein said gel electrophoresis is SDS PAGE.

102. (Previously presented) The method of claim 100, wherein said gel filtration is fast protein liquid chromatography gel filtration.

103. (Previously presented) The method of claim 100, wherein said visualisation technique is autoradiography.

104. (Previously presented) The method of claim 86, which further comprises :

v) characterising the site(s) in said Factor VIII molecule cleaved by said anti-Factor VIII allo-antibodies.

105. (Previously presented) The method of claim 104, wherein said characterisation is carried out by placing said Factor VIII in contact with said anti-Factor VIII allo-antibodies capable of degrading Factor VIII, separating and then sequencing the fragments of Factor VIII resulting therefrom.

106. (Currently amended) The method of claim 105, wherein said separation is carried out using a gel electrophoresis technique such as gel electrophoresis.

107. (Presently presented) The method of claim 106, wherein said separation is SDS PAGE.

108. (Currently amended) The method of claim 105, wherein said sequencing is carried out using an N-terminal sequencing technique such as N-terminal sequencing.

109. (Currently amended) The method of claim 108, wherein said sequencing carried out using an N-terminal sequencing technique such as N-terminal sequencing is by using an automatic protein microsequencer.

110. (Currently amended) The method of claim 1045, wherein said sequencing locates scissile bonds : Arg³⁷²-Ser³⁷³, located between the A1 and A2 domains, Tyr¹⁶⁸⁰-Asp¹⁶⁸¹, located on the N-terminus of the A3 domain, and Glu¹⁷⁹⁴-Asp¹⁷⁹⁵ located within the A3 domain of the Factor VIII molecule.

111. (Currently amended) An isolated amino acid sequence:

SEQ. ID No. 1: Ser Val Ala Lys Lys His Pro.

112. (Currently amended) An isolated amino acid sequence:

SEQ. ID No. 2: Asp Glu Asp Glu Asn Gln Ser.

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113. (Currently amended) An isolated amino acid sequence:

SEQ. ID No. 3: Asp Gln Arg Gln Gly Ala Glu.

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114. (Previously presented) A peptide or non-peptide analogue of an amino acid sequence of claim 111, which is capable of inhibiting any site in the Factor VIII molecule which is susceptible to being lysed by an anti-Factor VIII allo-antibody.

115. (Previously presented) A peptide or non-peptide analogue of an amino acid sequence of claim 112, which is capable of inhibiting any site in the Factor VIII molecule which is susceptible to being lysed by an anti-Factor VIII allo-antibody.

116. (Previously presented) A peptide or non-peptide analogue of an amino acid sequence of claim 113, which is capable of inhibiting any site in the Factor VIII molecule which is susceptible to being lysed by an anti-Factor VIII allo-antibody.

117. (Previously presented) A method of neutralising catalytic anti-Factor VIII allo-antibodies comprising using an anti-Factor VIII allo-antibody-catalysed Factor VIII degradation inhibitor.

118. (Previously presented) The method of claim 117, wherein said inhibitor comprises a protease inhibitor.

119. (Previously presented) The method of claim 118, wherein said protease inhibitor is 4-(2-aminoethyl)benzenesulphonyl fluoride hydrochloride.

120. (Previously presented) The method of claim 117, wherein said inhibitor inhibits cleavage of the scissile bonds : Arg³⁷²-Ser³⁷³, located between the A1 and A2 domains, Tyr¹⁶⁸⁰-Asp¹⁶⁸¹, located on the N-terminus of the A3 domain, and Glu¹⁷⁹⁴-Asp¹⁷⁹⁵ located within the A3 domain of the Factor VIII molecule.

121. (Currently amended) The method of claim 117, wherein said inhibitor comprises a peptide or non-peptide analogue of the isolated amino acid sequence:

SEQ. ID No. 1: Ser Val Ala Lys Lys His Pro.

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122. (Currently amended) The method of claim 117, wherein said inhibitor comprises a peptide or non-peptide analogue of the isolated amino acid sequence:

SEQ. ID No. 2: Asp Glu Asp Glu Asn Gln Ser.

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123. (Currently amended) The method of claim 117, wherein said inhibitor comprises a peptide or non-peptide analogue of the isolated amino acid sequence:

SEQ. ID No. 3: Asp Gln Arg Gln Gly Ala Glu.

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124. (Cancelled) A pharmaceutical composition which comprises a pharmaceutically effective amount of a pharmaceutically active ingredient selected from the group consisting of an anti-Factor VIII allo-antibody capable of degrading Factor VIII, and a pharmaceutically acceptable salt thereof, in a pharmaceutically acceptable excipient, vehicle or carrier.

125. (Cancelled) The pharmaceutical composition of claim 124, wherein said anti-Factor VIII allo-antibody capable of degrading Factor VIII is as obtainable from the method of claim 86.

126. (Cancelled) A method of therapeutic treatment of a mammal suffering from a pathology resulting from abnormal level of Factor VIII in the blood thereof, wherein a therapeutically effective amount of a pharmaceutically active ingredient selected from the group consisting of at least one anti-Factor VIII allo-antibody capable of degrading Factor VIII, and a pharmaceutically acceptable salt thereof, in a pharmaceutically acceptable excipient, vehicle or carrier, is administered to said mammal.

127. (Cancelled) The method of claim 126, wherein said pathology results from the presence of an excess of Factor VIII in the blood thereof.

128. (Cancelled) The method of claim 127, wherein said pathology is of thrombotic nature.

129. (Cancelled) The method of claim 128, which is a therapeutic treatment of a mammal suffering from thrombosis.

130. (Cancelled) A pharmaceutical composition which comprises a pharmaceutically effective amount of a pharmaceutically active ingredient selected from the group consisting of a Factor VIII degradation inhibitor of claim 117, and a pharmaceutically acceptable salt thereof, in a pharmaceutically acceptable excipient, vehicle or carrier.

131. (Cancelled) A method of therapeutic treatment of a mammal suffering from a pathology resulting from the sub-physiological level of Factor VIII in the blood thereof, wherein a therapeutically effective amount of a pharmaceutically active ingredient selected from the group consisting of at least one Factor VIII degradation inhibitor, and a pharmaceutically acceptable salt thereof, is administered to said mammal.

132. (Cancelled) The method of claim 131, wherein said inhibitor comprises a protease inhibitor.

133. (Cancelled) The method of claim 132, wherein said protease inhibitor is 4-(2-aminoethyl)benzenesulphonyl fluoride hydrochloride.

134. (Cancelled) The method of claim 131, wherein said inhibitor inhibits cleavage of the scissile bonds : Arg³⁷²-Ser³⁷³, located between the A1 and A2 domains, Tyr¹⁶⁸⁰-Asp¹⁶⁸¹, located on the N-terminus of the A3 domain, and Glu¹⁷⁹⁴-Asp¹⁷⁹⁵ located within the A3 domain of the Factor VIII molecule.

135. (Cancelled) The method of claim 131, which comprises a peptide or non-peptide analogue of the amino acid sequence:

Ser Val Ala Lys Lys His Pro.

136. (Cancelled) The method of claim 131, which comprises a peptide or non-peptide analogue of the amino acid sequence:

Asp Glu Asp Glu Asn Gln Ser.

137. (Cancelled) The method of claim 131, which comprises a peptide or non-peptide analogue of the amino acid sequence:

Asp Gln Arg Gln Gly Ala Glu.

138. (Cancelled) The method of claim 131, wherein said pathology is of haemophilic nature.

139. (Cancelled) The method of claim 138, wherein said pathology of haemophilic nature is a disease involving coagulation defects due to Factor VIII insufficiency.

140. (Cancelled) The method of claim 138, which is a method of therapeutic treatment of a mammal suffering from haemophilia A.

141. (Currently amended) An anti-Factor VIII allo-antibody-catalysed Factor VIII degradation inhibitor, which comprises a peptide or non-peptide analogue of the isolated amino acid sequence:

SEQ. ID No. 1: Ser Val Ala Lys Lys His Pro.

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142. (Currently amended) An anti-Factor VIII allo-antibody-catalysed Factor VIII degradation inhibitor, which comprises a peptide or non-peptide analogue of the isolated amino acid sequence:

SEQ. ID No. 2: Asp Glu Asp Glu Asn Gln Ser.

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143. (Currently amended) An anti-Factor VIII allo-antibody-catalysed Factor VIII degradation inhibitor, which comprises a peptide or non-peptide analogue of the isolated amino acid sequence:

SEQ. ID No. 3: Asp Gln Arg Gln Gly Ala Glu.

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144. (Cancelled) A pharmaceutical composition, which comprises a pharmaceutically effective amount of an anti-Factor VIII allo-antibody-catalysed Factor VIII degradation inhibitor.

145. (Cancelled) The pharmaceutical composition of claim 144, which comprises a protease inhibitor.

146. (Cancelled) The pharmaceutical composition of claim 145, wherein said protease inhibitor is 4-(2-aminoethyl)benzenesulphonyl fluoride hydrochloride.

147. (Cancelled) The pharmaceutical composition of claim 144, wherein said inhibitor inhibits cleavage of the scissile bonds : Arg³⁷²-Ser³⁷³, located between the A1 and A2 domains, Tyr¹⁶⁸⁰-Asp¹⁶⁸¹, located on the N-terminus of the A3 domain, and Glu¹⁷⁹⁴-Asp¹⁷⁹⁵ located within the A3 domain of the Factor VIII molecule.

148. (Cancelled) The pharmaceutical composition of claim 144, which comprises a peptide or non-peptide analogue of the amino acid sequence:

Ser Val Ala Lys Lys His Pro.

149. (Cancelled) The pharmaceutical composition of claim 144, which comprises a peptide or non-peptide analogue of the amino acid sequence:

Asp Glu Asp Glu Asn Gln Ser.

150. (Cancelled) The pharmaceutical composition of claim 144, which comprises a peptide or non-peptide analogue of the amino acid sequence:

Asp Gln Arg Gln Gly Ala Glu.

151. (Currently amended) An isolated anti-Factor VIII allo-antibody, which has a catalytic activity capable of catalysing degradation of Factor VIII.

152. (Currently amended) An isolated anti-Factor VIII allo-antibody which is obtainable by the method of claim 86.

153. (Currently amended) The isolated anti-Factor VIII allo-antibody of claim 151, which cleaves the following scissile bonds in the Factor VIII molecule: Arg³⁷²-Ser³⁷³, located between the A1 and A2 domains, Tyr¹⁶⁸⁰-Asp¹⁶⁸¹, located on the N-terminus of the A3 domain, and Glu¹⁷⁹⁴-Asp¹⁷⁹⁵ located within the A3 domain of the Factor VIII molecule.

154. (Currently amended) The isolated anti-Factor VIII allo-antibody of claim 152, which cleaves the following scissile bonds in the Factor VIII molecule: Arg³⁷²-Ser³⁷³, located between the A1 and A2 domains, Tyr¹⁶⁸⁰-Asp¹⁶⁸¹, located on the N-terminus of the A3 domain, and Glu¹⁷⁹⁴-Asp¹⁷⁹⁵ located within the A3 domain of the Factor VIII molecule.